

**HUMAN TELOMERASE AND FUNCTIONAL TELOMERASE VARIANTS**

USSN 09/438,486  
TTC 015389-002931US  
Docket 018/062c

**Allowed Claims**

- 1 to 21. *(Canceled)*
22. An isolated cDNA encoding human telomerase protein, wherein said cDNA is contained in plasmid pGRN121 having ATCC Deposit Accession No. 209016.
23. *(Canceled)*
24. An isolated cDNA encoding human telomerase reverse transcriptase protein, wherein the cDNA has the restriction map shown in Figure 49.
25. An isolated nucleic acid encoding a telomerase reverse transcriptase protein, wherein the polynucleotide hybridizes to a nucleic acid having the sequence in SEQ ID NO:173 at 5°C to 25°C below  $T_m$  in aqueous solution at 1 M NaCl.
26. An isolated cDNA encoding a naturally occurring human telomerase reverse transcriptase protein, wherein the 5' terminus of the cDNA consists of ATG covalently linked to a nucleotide sequence commencing with CCC GTC CCG (contained in SEQ ID NO:173).
27. An isolated cDNA encoding human telomerase reverse transcriptase protein, wherein the cDNA hybridizes to the cDNA insert in plasmid pGRN121 at 5°C to 25°C below  $T_m$  in aqueous solution at 1 M NaCl.
28. An isolated cDNA encoding human telomerase reverse transcriptase protein, wherein the cDNA hybridizes to a nucleic acid having the sequence in SEQ ID NO:173 at 5°C to 25°C below  $T_m$  in aqueous solution at 1 M NaCl.
29. *(Canceled)*
30. The isolated nucleic acid of claim 25, wherein the 5' terminus consists of ATG covalently linked to a nucleotide sequence commencing with CCC GTC CCG.
- 31 to 33. *(Canceled)*
34. The nucleic acid of claim 25, wherein the encoded human telomerase reverse transcriptase protein comprises the motifs FFYVTE (SEQ ID NO:112), PKP, AYD, QG, and DD.
35. The nucleic acid of claim 25, which is a cDNA.
- 36 to 39. *(Canceled)*

**METHOD FOR IDENTIFYING NUCLEOTIDE SEQUENCES  
ENCODING TELOMERASE PROTEIN**

USSN 09/766,253

*Docket 018/180c*  
*TTC 015389-002921US*

**Allowed Claims**

1 to 7. *(Cancelled)*

8. A method for detecting the presence of polynucleotide sequences encoding at least a portion of telomerase in a biological sample, comprising the steps of:
- a) obtaining an amino acid sequence encoded in a polynucleotide contained in the biological sample;
  - b) comparing the amino acid sequence with the telomerase amino acid motif  
 $W-X^{12}-FFY-X^1-TE$ ,  
 wherein  $X^n$  is a sequence of "n" unspecified amino acids; and then
  - c) determining that the sample contains a polynucleotide encoding at least a portion of telomerase if the sequence obtained in step a) contains said telomerase amino acid motif.

9 to 20. **CANCELLED**

21. The method of claim 8, wherein the telomerase is a telomerase of a single-celled eukaryote.
22. The method of claim 8, wherein the telomerase is a mammalian telomerase.
23. The method of claim 8, wherein the telomerase is a human telomerase.
24. The method of claim 8, wherein the polynucleotide contains SEQ. ID NO:100.
25. The method of claim 8, further comprising comparing the sequence determined in step b) with the reverse transcriptase motif  $R-X^2-PK-X^4-R-X^1-I$ .
26. The method of claim 8, further comprising comparing the sequence determined in step b) with the reverse transcriptase motif  $F-X^3-D-X^3-CYD$ .
27. The method of claim 8, comprising deciding that the sample contains a polynucleotide sequence encoding at least a portion of telomerase if the sequence determined in step b) contains the amino acid motif  
 $h_1-X^1-W-h_2-X^4-h_3-X^2-h_4-h_5-h_6-h_7-FFY-X^1-TE$ ,  
 wherein
  - $h_1$  is L or I;
  - $h_2$  is L or I;
  - $h_3$  is V or I;
  - $h_4$  is L or I;
  - $h_5$  is L or I;
  - $h_6$  is R or Q; and
  - $h_7$  is S, T or C.

**Telomerase Peptides and Immunogenic Compositions**

USSN 09/843,676

*Docket 018/181c***Allowed Claims**

21. An isolated polypeptide that induces anti-hTERT specific antibody, consisting of 10 or more consecutive amino acids of SEQ. ID NO:225.
22. The polypeptide of claim 21, containing an amino acid sequence selected from SEQ. ID NO:112, SEQ. ID NO:113, SEQ. ID NO:114, SEQ. ID NO:115, SEQ. ID NO:116, and SEQ. ID NO:117.
23. The polypeptide of claim 21, which does not retain the telomerase catalytic activity of native human telomerase reverse transcriptase.
24. A pharmaceutical composition comprising the polypeptide of claim 21 and a pharmaceutically acceptable carrier.
25. An immunogenic composition that induces anti-hTERT specific antibody, comprising a peptide and an adjuvant, wherein the peptide consists of 10 or more consecutive amino acids of SEQ. ID NO:225.
26. The composition of claim 25, wherein the adjuvant is selected from Freund's adjuvant, an mineral gel, aluminum hydroxide, lysolecithin, pluronic polyol, a polyanion, a peptide, an oil emulsion, keyhole limpet hemocyanin, dinitrophenol, Bacillus Calmette-Guerin, and Corynebacterium parvum.
27. A method for eliciting an immune response to telomerase reverse transcriptase protein in a subject, comprising administering to the subject the composition of claim 25.
28. The method of claim 27, further comprising assessing whether telomerase-specific antibody is produced as a result of the administration.
29. An immunogenic composition that induces anti-hTERT specific antibody, comprising a peptide and an adjuvant, wherein the peptide consists of 5 to 10 consecutive amino acids of SEQ. ID NO:225.
30. The composition of claim 29, wherein the adjuvant is selected from Freund's adjuvant, an mineral gel, aluminum hydroxide, lysolecithin pluronic polyol, a polyanion, a peptide, an oil emulsion, keyhole limpet hemocyanin, dinitrophenol, Bacillus Calmette-Guerin, and Corynebacterium parvum.
31. A method for eliciting an immune response to telomerase reverse transcriptase protein in a subject, comprising administering to the subject the composition of claim 29.
32. The method of claim 31, further comprising assessing whether telomerase-specific antibody is produced as a result of the administration.
33. The polypeptide of claim 21, produced by recombinant expression.

34. The polypeptide of claim 21, produced by chemical synthesis.
35. A chimeric molecule comprising:
  - a polypeptide that consists of 10 or more consecutive amino acids of SEQ. ID NO:225, and
  - an immunogenic second protein,
  - wherein the polypeptide is fused to the second protein so as to form a chimeric molecule that induces anti-hTERT specific antibody.
36. The chimeric protein of claim 35, wherein the second protein is keyhole limpet hemocyanin.
37. An immunogenic composition comprising the chimeric protein of claim 35, and an adjuvant.
38. A chimeric molecule comprising:
  - a polypeptide that consists of 5 to 10 consecutive amino acids of SEQ. ID NO:225, and
  - an immunogenic second protein,
  - wherein the polypeptide is fused to the second protein so as to form a chimeric molecule that induces anti-hTERT specific antibody.
39. The chimeric protein of claim 38, wherein the second protein is keyhole limpet hemocyanin.
40. An immunogenic composition comprising the chimeric protein of claim 38, and an adjuvant.